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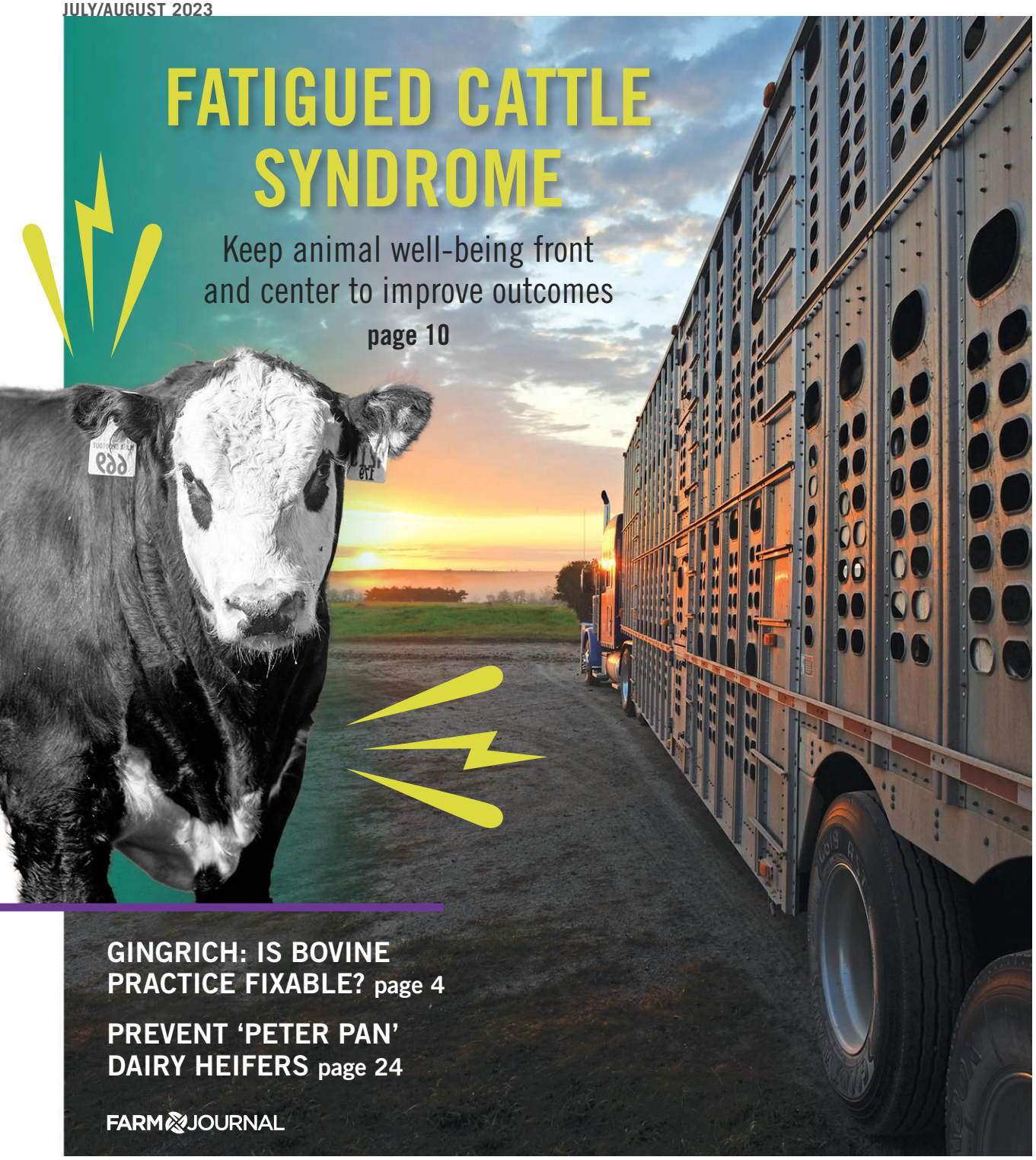

FATIGUED CATTLE SYNDROME

Keep animal well-being front and center to improve outcomes

page 10

FARM JOURNAL


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COVER COLLAGE: WYATT BECHTEL AND AHA

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Guest Editorial

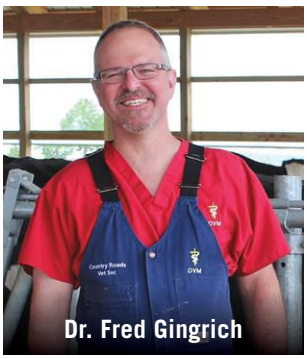
This month, Bovine Veterinarian is featuring a guest editorial by Dr. K. Fred Gingrich II, executive director of the American Association of Bovine Practitioners (*aabp.org*). Dr. Gingrich addresses some of the factors he believes contribute to the poor recruitment and retention of large animal veterinarians, and he offers some recommendations for your consideration. Our thanks to Dr. Gingrich for allowing us to share his thoughts and insights here.

Rhonda Brooks

RHONDA BROOKS, EDITOR

What is Happening with Bovine Practice, and is it Fixable?

We have many issues to face as an organization that the AABP office and our many volunteers work on for our members. One of the big issues facing our segment of the profession is recruitment and retention of veterinarians in rural mixed animal or bovine practice. This is not a new problem, but it is a problem that appears to be getting worse. According to the AVMA Census of Veterinarians, in 2022 there were 78,717 veterinarians in clinical practice and a total of 7,540 in food animal or mixed practice combined. Over the past 10 years, there has been a 22% increase in the number of veterinarians in clinical practice but at the same time a 15% decrease in the number of veterinarians in food animal or mixed practice. AABP membership retention data shows about 50% of veterinarians leave AABP membership during the first five to 10 years of practice, and our exit surveys demonstrate the No. 1 reason for leaving AABP membership is leaving cattle practice for companion animal practice.



Dr. Fred Gingrich

There have been many efforts to date to fix this problem. These have included increasing the number of veterinary schools, developing schools to target students interested in rural practice, loan repayment programs, externships, recruiting from rural communities, increasing the number of seats at veterinary schools, and developing continuing education resources for recent graduates in cattle practice. But the data shows the problem is worsening. Currently, there are 143 active job openings on our website, and we have 250 AABP student members graduating this year, most of whom likely already have jobs secured.

I have listened to and discussed this issue with many members. These conversations typically end up with some type of blame followed by a proposed solution. Examples would be that the younger generation does not know how to work, veterinary school tuition is to blame, we need to recruit farm kids, academics do not train students for the "real world," academics disparage food

animal practice, recent graduates need to pay their dues like we did, and recent graduates need to recognize we should feel honored to work with these great clients.

EVALUATE INTERVENTIONS

Cattle veterinarians know how to identify problems and create solutions for our clients, but we should also evaluate those interventions to see if they are working. I would propose that as a profession we have not truly evaluated the interventions, because the data clearly demonstrates the problem is getting worse despite multiple solutions. I would also propose that our language seems to focus on "what is going on with our recent graduates" indicating there is a problem with them that needs fixed. Instead, maybe we should critically evaluate bovine practice and ask if we have created a business model where very few people want to stay.

I have had the opportunity to listen to many recent graduates and their struggles. I am horrified at some of the stories that have been shared with me. I used to think this was rare until I heard more and more of them. Examples include associates that were subject to blatant discrimination, practices that were mad their associate was pregnant and refused to adjust their work duties, no maternity leave, emergency services for anyone who happened to call, no safety assurances for associates doing emergencies alone, unreasonable work schedules, working after scheduled hours, not able to grow as a veterinarian, no mentorship, and minimal continuing education opportunities by providing a stipend that does not even cover cost of attendance.

The problem is multifactorial, and we cannot identify one thing to improve the situation, but it has become clear to me that we need to fix what we can fix. If we look at the results of our graduating senior surveys, the number of hours worked and the salary offered are the two biggest challenges when job searching. Emergency services are a part of bovine practice, but what can we do to improve emergency duties for our associates? Does everyone share the responsibility? Can we partner with other practices? Do you offer this service for anyone who has your phone number or just regular clients? Is training offered to decrease the number of emergency calls? Are associates paid to be on call and receive pay for going to the call? Is everyone welcome in your practice, or do our language and behavior not include everyone's beliefs, gender, race, ethnicity? The current student population in veterinary schools is about 25% non-white racial or ethnic background. The current student population is over 80% female. Do you have paid maternity leave for your associates? What is the cost of losing an associate in your practice versus the cost of paying them during child leave when they have a large debt load to service?

"Are you properly mentoring associates? Do you have a formal program in place to develop their interests?"

PHOTO: ISTOCK

MAKE IT BETTER

Are you properly mentoring associates? Do you have a formal program in place to develop their interests? Do you try their suggestions or find out what they are interested in and tell them to go for it? Do you offer paid student externships to find your next associate? Do you have a human resources manager in your practice? Have you taken any training on how to make your work environment safer and more inclusive? Do your associates have a day off during the week?

Do you offer competitive salaries? The cost of veterinary services for a beef or dairy operation is negligible, but the value can be critical to our clients' businesses. When was the last time you evaluated your fee structure? Where are there opportunities to increase fees, so everyone can be paid a competitive salary?

All of the above is pretty common in small animal practice, and that is our competition. We cannot fix everything, but I would challenge each of us to critically look at our practice, and instead of saying "what is wrong with these recent graduates," we should instead ask "what can I improve in my practice to make it better?" **BV**

BY DR. FRED GINGRICH

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Evolving Expectations

AABP sets annual conference theme and agenda

BY GENI WREN

The 56th American Association of Bovine Practitioners (AABP) Annual Conference is set for Sept. 21-23, in Milwaukee, Wis. The theme is "Evolving Expectations."

Registration is now open, and preregistration ends Aug. 10

"The conference theme this year reflects AABP's mission to provide continuing education to cattle veterinarians and advance their practices," says Dr. K. Fred Gingrich II, AABP executive director. "Our annual conference is the biggest event we plan for all year, and I am always excited to welcome our members to the conference every September."

AABP president-elect and 2023 program chair Dr. Michael Capel says the theme "Evolving Expectations" encapsulates many of the challenges bovine veterinarians deal with every day.

"Nothing stays the same in our business, and we are constantly faced with opportunities to provide new services, challenges with staffing and recruitment, and juggling professional and personal life balance," he says. "'Evolving Expectations' helps change our mindset to finding solutions instead of putting up barriers to success."

JOURNEY OF INNOVATION

Keynote speaker Sara Frasca, an expert on innovation and the power of human creativity, is known for her high energy, dynamic and engaging presentations. She will speak on "The Journey of Innovation" during the event.

Conference sessions will include cutting-edge information on beef and dairy bovine medicine and health, practice management, clinical skills, clinical forums, research summaries, practice tips, student sessions and more.

> *"'It's a unique opportunity to focus on specific topics with excellent instructors and like-minded classmates."*
> —Dr. Dave Sjeklocha

The American Association of Small Ruminant Practitioners will meet jointly with AABP. The conference will be submitted for RACE-approved continuing education.

"The scientific sessions are designed to provide our membership with big-picture topics to stimulate conversation as well as very focused content that practitioners can take home and use immediately," Capel says.

The preconference seminar schedule offers something for everyone.

"Practitioners who have experienced AABP preconference seminars are often repeat participants in future preconference seminars, because they see the value in learning from some of the best and most innovative in the field," says Dr. Dave Sjeklocha, AABP vice president and preconference seminar chair.

"It is truly a unique opportunity to spend anywhere from a half day up to three days focused on a specific topic with excellent instructors and like-minded classmates. This year, we will have 12 preconference seminars from which to choose," Sjeklocha adds.

Seminars include several tried-and-true standards, such as milk quality, replacement dairy heifers and beef heifer development. Newer seminars include beef cow-calf nutrition, field anesthesia and pain management, using on-farm data

American Association of Bovine Practitioners
56th Annual Conference
September 21-23 | Milwaukee, Wis.

MORE INFO

Scan the QR code to view preconference seminar information, conference schedule, Amstutz Scholarship Auction items and to register.

for problem solving, Kansas State antibiotic stewardship certification, and calf care and quality assurance instructor training.

Other events include the student Quiz Bowl, student case presentations, research summaries, awards and scholarships, a Job Fair, the Amstutz live and silent scholarship auctions and more.

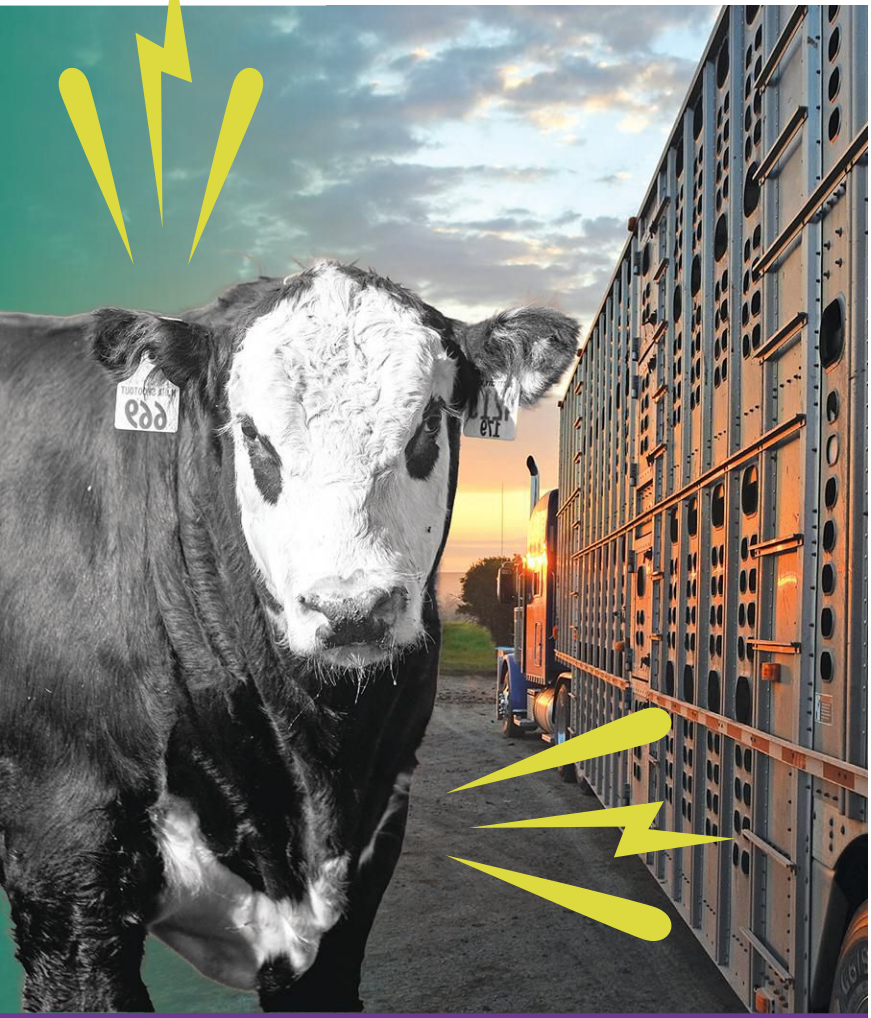
This will be the 11th year for the 5K Stampede Fun Run, sponsored by Boehringer Ingelheim. Proceeds will benefit the Amstutz Scholarship Fund. Attendees can sign up for the 5K when they register for the conference. In fact, the first 5K Stampede was held at the 2013 Annual Conference — in Milwaukee.

"Our host city, Milwaukee, has a great deal to offer including its well-known breweries, baseball, food, parks on the shores of Lake Michigan and rich historical and cultural attractions," Capel says. "We look forward to welcoming you to the 2023 conference." BV

Geni Wren is the director of marketing and communications for AABP.

Fatigued Cattle Syndrome

Keeping animal well-being front and center can improve outcomes



"There isn't a more expensive dead than one that's been delivered to the packing plant. It's a big-time hickey to your bottom line."
—Dr. Dan Thomson

BY RHONDA BROOKS

As temperatures climb ever higher in the summer months, an infrequent but concerning problem producers, veterinarians and processors encounter is Fatigued Cattle Syndrome.

At its core, the problem is a metabolic disorder, likely a multifactorial problem, that reduces the mobility of fed cattle presented to abattoirs, according to Jacob Hagenmaier, veterinarian and director of clinical services for the Veterinary & Biomedical Research Center, based in Manhattan, Kan.

A similar problem exists in hogs called fatigued pig syndrome (FPS), hence the name for the problem in cattle. The USDA says the "predisposing factors contributing to FPS can be characterized as the pig, environment/facility, people, transport and processing plant." Similar factors are at play in cattle.

A LOOK BACK AT THE START

The syndrome was first reported in 2013, when there were observations of cattle arriving at packing plants that were "nonambulatory, slow and difficult to move, and, in some cases, sloughing their hoof walls in packing facilities" (Cima, 2013; Vance, 2013).

"A majority of those cattle did not possess obvious signs or cause of lameness," Hagenmaier says. "In feedlots, we tend to think of foot rot, musculoskeletal injuries or digital dermatitis as the most common causes of impaired mobility.

"These were cattle presenting with decreased mobility and muscle tremors but with no specific cause," he adds. "So that made us begin to ask some

7 PRACTICES THAT HELP WITH PREVENTION

There are multiple strategies to reduce the incidence of Fatigued Cattle Syndrome, including how cattle are handled, fed and managed from arrival at the feedyard to the time they leave for slaughter. Here are seven practices Jacob Hagenmaier and Dan Thomson recommend to minimize the potential for the Syndrome to develop.

1. **Feed cattle a good trace mineral package.** "We want to make sure we don't have any nutritional deficiencies in any of our trace or macro minerals," Hagenmaier says. "Make sure you have a well-rounded nutritional program, which most feedlots do."

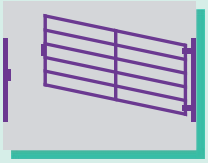
2. **Use low-stress handling practices at the yard and at loadout.** "If you and I were to sit on a couch and eat potato chips all year and then be asked to walk a mile, it might be a little difficult for us, right? So be respectful of the events of the day (you ship cattle) relative to what that animal has been doing 150 days on feed prior to that," Hagenmaier says.

3. **Consider how you manage the loadout process and the time leading up to it.** To minimize stress, plan on staging cattle near loadout a day or two prior to shipping.

4. **Evaluate who you have working cattle in the pen and moving them out of the pen.** "You want people who are familiar with the cattle working them, if at all possible. You also need a sufficient number of people on hand to do the job, which can reduce the stress on the animals," Thomson says.

   Along with that, walk animals from pens to loadout, taking plenty of time in the process so cattle aren't rushed and don't run.

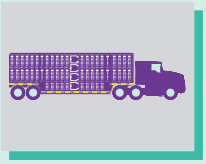
5. **Determine what you're asking the cattle to do in preparation for loading.** "If you can have them go out the front of the pen, where they normally congregate that might be less stressful than going out the back of the pen," Thomson says.



6. **Don't overload transport systems with too many animals.** When crushing injuries occur, creatine kinase, a so-called "leakage" enzyme that is released during rhabdomyolysis, increases in circulation. It's the most widely used enzyme for evaluation of muscular disease in cattle, according to Cornell University's eClinPath, an online textbook on veterinary clinical pathology.

   Hagenmaier says the measurable presence of creatine kinase is very suggestive of severe cases of Fatigued Cattle Syndrome.

   "What's interesting to me is when we have tub-based systems, we talk about not overloading the tub with regards to arrival processing, but loading fat cattle is no different," he adds. "And actually, they're at more of a risk, because we have that much more weight and that much more force so that we can cause some pretty severe crushing injuries when we're trying to load too many heavy cattle at one time."



7. **Keep cattle well-being front and center.** Be set up to provide animals with adequate nutrition, water, shade, pen space, etc. Taking these factors into consideration is the right thing to do and also improves harvest outcomes. "Accommodate fat animals, because their needs are certainly different than those of arriving cattle at the feedlot," Hagenmaier encourages.

NAMI MOBILITY SCORING SYSTEM

MOBILITY SCORE	DEFINITION
1	Normal, walks easily, no apparent lameness, no change in gait
2	Exhibits minor stiffness, shortness of stride, slight limp, keeps up with normal cattle in the group
3	Exhibits obvious stiffness, difficulty taking steps, obvious limp, obvious discomfort, lags behind normal cattle walking as a group
4	Extremely reluctant to move even when encouraged by a handler; statue-like

questions about what exactly was driving this new clinical presentation in fed cattle at the time of shipment for harvest."

In some cases, affected cattle recover and pass ante-mortem inspection and enter the food chain. Animals that become non-ambulatory have to be euthanized and can't enter the supply chain.

"There isn't a more expensive dead than one that's been delivered to a packing plant; it's a big-time hickey to your bottom line," says Dan Thomson, veterinarian, educator at Kansas State University and host of "DocTalk" TV.

A locomotion scoring system was developed to help the industry assess cattle arriving at packing facilities. Known as the NAMI Mobility Scoring System, it was created as a collaboration between NAMI's Animal Welfare Committee and industry experts (see above).

SYMPTOMS AND SIGNS

Hagenmaier says metabolic acidosis is often present in cattle that score a 3 or 4 on the mobility system.

"High lactate is a key blood abnormality involved with this disease. When God made cattle, the one thing he made them deficient in is lung capacity — their ability for aerobic respiration to get oxygen to supply all those muscles," he says.

In addition, Hagenmaier speculates that increased body weights at the time of shipment for slaughter might contribute to a higher prevalence of cattle with impaired mobility at the abattoir.

"If you go into the USDA data, (you'll see there's) 10 lb. of carcass weight that we've been adding on these animals every year since approximately 2010," he says. "So the question is, is our musculoskeletal system keeping up with as many pounds as we're putting on?"

Soon after fatigued cattle syndrome was identified, some beef industry members proposed the problem was more prevalent in cattle fed a beta-agonist, but research to date has indicated that is unlikely to be the case. Kansas State researchers and others continue to evaluate beta-agonist products. **BV**

LEARN MORE

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3 Steps to Running an Innovation Sprint

Create a process to brainstorm, prioritize and implement ideas for your business

BY SARA SCHAFER

The best ideas for your business can come from anyone on your team. How can you foster an environment of innovation and strategic focus? Use a process Mark Faust calls an innovation sprint.

"The exercise usually focuses on individual development, but you could apply it to items you want to innovate within your organization," says Faust, president of Echelon Management. "It will prove instantly to you the value of an abundance of ideas and relationships, as well as the benefits of the rules for productive strategy sessions."

This process can be used as a meeting opener or brainstorming tool. Gather your veterinary team and follow the three-part format provided by Faust.

MAKE CHANGE

The intel you gather during Phase III can be used to drive your strategy, Faust says. Plus, the process is a great team-building exercise.

"This tool helps anyone to both connect a more powerful and positive association with changing a behavior as well as get ideas on how to accomplish the change," he says. BV

RULES FOR STRATEGY SESSIONS

1. **Set aside** titles and status.
2. **Require everyone** to declare their point of view.
3. **Postpone judgment.** There are no bad ideas.
4. **Say yes** and eliminate the "buts."

PHASE I

- **Pick something you want to improve.**
- **State it in the positive,** Faust says. For instance, if you picked "get more effective at saying no" change that to "get myself and my team to not overcommit."
- **Put your team into groups of four.**
- **Have each person state what they want to improve,** in this sentence format:

  "When I improve _____, a benefit will be _____." or
  "When I get better at _____, a benefit will be _____."
- **Repeat four times so each person will have four or more benefits.**

PHASE II

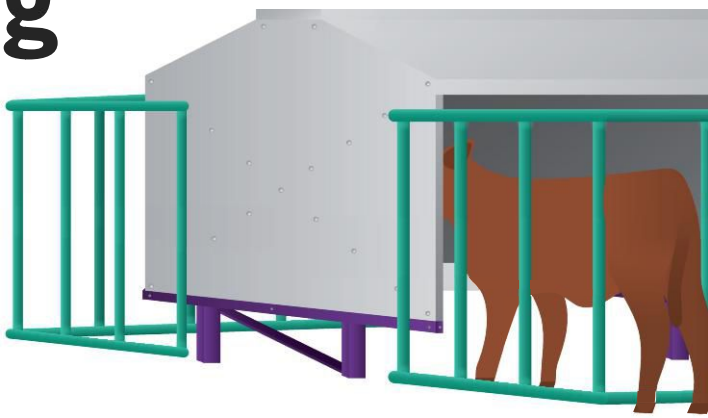
- **Have everyone grab a notebook** and pen and pair up with one person to ask them, **"What is one idea I could do to _____"** in regard to the new behavior or habit.
- **Write down the idea.** Listen without judgment and thank each person for their idea.
- **Allow the other person to ask** for an idea and they do the same.

PHASE III

- **Reconvene the whole group.**
- **Ask participants to share** one word to describe the process. Capture those words on paper.
- **Optionally, individuals could share** with their groups what they learned. This helps to anchor a positive energy as well as get new ideas for making your first area of change.

Creep Feeding

8 ways to tell whether it will pay this year



BY MARK Z. JOHNSON

In most circumstances involving a commercial cow-calf operation, creep feeding is not usually cost-effective. This year, however, it's worth evaluating the potential return-on-investment.

Some quick cowboy math based on current economics provides some perspective: Assuming a creep ration is purchased at $400 per ton (or 20¢ per pound) and calves would convert at 10:1 feed-to-gain ratio, the cost of adding 1 lb. of weaning weight is $2.

At this point in the cattle cycle, the value of weaned calves is expected to be well over $2 per pound this fall. Producers need to consider whether that margin can cover the additional labor, cost of a creep feeder, and whether forage will be sparse for spring-born calves from now until weaning and later in the year. BV

HERE ARE EIGHT ADDITIONAL CONSIDERATIONS:

1. Creep feeding can increase weaning weights from 20 lb. to 80 lb., but typically the value of added weight gain will not cover the added expenses unless feed is exceptionally inexpensive or when value of added weight gain is exceptionally high.

2. Currently, feed is relatively expensive, but the value of added weight gain is exceptionally high.

3. In a summary of 31 experiments where calves had unlimited access to creep feed, average increased calf weaning weight was 58 lb.

4. Conversion efficiency can range from 3 lb. to 20 lb. of feed required per pound of added weight gain. High-quality, abundant forage results in very poor feed conversion because one high-quality feed (forage) is being replaced by another. Similarly, the greater the plane of maternal nutrition, the poorer the conversion of creep feed to calf gain. In Oklahoma State University fall-calving experiments, efficiency of creep feed conversion to calf gain is quite good, because native range forage quality is low and cows are in a maintenance to negative energy balance. Results have been around 4.5 lb. to 5 lb. creep feed:gain when fall-calving cows are getting around 5 lb. of supplemental feed.

5. Flesh condition of calves that are marketed at weaning can lead to discounts. If calves are fed free-choice creep for 90 days or longer, there is a risk of over-conditioning leading to a market discount. On the positive side, if heavy creep-fed calves go straight to the feedyard for finishing, their carcass weights and marbling scores, in most studies, are improved.

6. Heavier weaned calves are worth less money per pound. Typically prices fall $10 to $20 per cwt as calves get heavier.

7. Calves prefer milk first, palatable creep feed second, then forage. Therefore, creep feeding does not take pressure off of cows.

8. Consider that the intensity of creep feed and forage consumption is elastic. The lower the quality of the forage, the more creep feed and less forage calves want to consume and vice versa.

ILLUSTRATION: LINDSEY POUND

The first CD46 gene-edited calf, named Ginger, was born healthy on July 19, 2021.

Proof Of Concept

Gene-edited calf demonstrates resistance to BVDV

BY MARIBEL ALONSO

Scientists have collaborated to produce the first gene-edited calf with resistance to bovine viral diarrhea virus (BVDV).

The recent study, published in Proceedings of the National Academy of Sciences Nexus, results from a collaboration between the USDA's Agricultural Research Service (ARS), the University of Nebraska–Lincoln (UNL), the University of Kentucky, and industry partners, Acceligen and Recombinetics, Inc.

BVDV can be disastrous for pregnant cows because it can infect developing calves, causing spontaneous abortions as well as low birth rates. Some infected calves survive but remain infected for life, shedding massive amounts of virus to other cattle.

Despite more than 50 years of vaccine availability, controlling BVDV disease remains a problem because vaccines are not always effective in stopping transmission.

Over the past 20 years, the scientific community discovered the main cellular receptor (CD46) and the area where the virus binds to that receptor causes infection in cows. Scientists modified the virus binding site in this recent study to block infection.

Apen Workman, lead author and researcher at the ARS U.S. Met Animal Research Center (USMARC) in Clay Center, Neb., says, "Our objective was to use gene-editing technology to slightly alter CD46 so it wouldn't bind the virus yet would retain all its normal bovine functions."

THE PROCESS USED

The scientists first tested this idea in cell culture. After seeing promising outcomes in the laboratory, Acceligen edited cattle skin cells to develop embryos carrying the altered gene. The embryos were transplanted into surrogate cows to test whether this approach might also reduce virus infection in live animals.

The practice worked, and the first CD46 gene-edited calf was born healthy on July 19, 2021.

The calf, named Ginger, was observed for several months and then later challenged with the virus to determine if she could become infected. She was housed for a week with a BVDV-infected dairy calf that was born shedding virus.

Ginger's cells displayed significantly reduced susceptibility to BVDV, which resulted in no observable adverse health effects. The scientists will monitor her health and ability to produce and raise her own calves.

This proof-of-concept study demonstrates the possibility of reducing the burden of BVDV-associated diseases in cattle by gene editing.

The edited calf also represents another potential opportunity to lessen the need for antibiotics in agriculture because BVDV infection also puts calves at risk for secondary bacterial diseases. This promising trait is still in the research phase, and no associated beef is entering the U.S. food supply at this time. **BV**

Maribel Alonso is a public affairs specialist for USDA-ARS.

PHOTOS: UNIVERSITY OF NEBRASKA-LINCOLN

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Personality Matters

Not every cow adapts well to an AMS

BY TAYLOR LEACH

Researchers at the University of Guelph recently set out to determine the effects of dairy cow personality traits on their adaptation to an automated milking system (AMS) following calving. Sixty Holstein dairy cows were assessed for personality traits using three tests conducted at 24 days before calving and 24 days after their first introduction to an AMS, which occurred approximately three days after calving.

THREE-PART TEST

The assessment included: a novel arena test, a novel object test and a novel human test. The assessment revealed three factors interpreted as personality traits before calving. These traits were deemed explorer, active and bold. The postcalving test revealed two factors and were interpreted as active and explorer.

Data was collected for seven consecutive days after the cow's first introduction to the AMS and then collected again on day 21 through 27. Few cows scored high for the explorer personality. Cows that scored high for activeness in the precalving test tended to have fewer fetching events and a higher coefficient of variation of milk yield in the first seven days after introduction to the AMS, while bolder cows tended to have higher milk yield during that time period.

In the postcalving test, more active cows tended to have more frequent milkings and voluntary visits per day, as well as a lower cumulative milk yield from day 21 to 27 after introduction to the AMS.

Cows that scored high for boldness and activeness adapted better to the AMS immediately after calving, while cows that scored low for activeness and high for boldness performed better in terms of milk yield and milking activity in early lactation.

According to the researchers, this study demonstrates personality traits affect milking activity and milk yield of dairy cows milked with an AMS and, therefore, could be useful for selection of cows who might best adapt to and use an AMS. **BV**

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[1]Lekeux P. Bovine respiratory disease complex: a European perspective. *Bov Pract*. 1995;29:71-75.

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The Power of a Hip Lift

Good ideas can come from anyone anywhere at any time

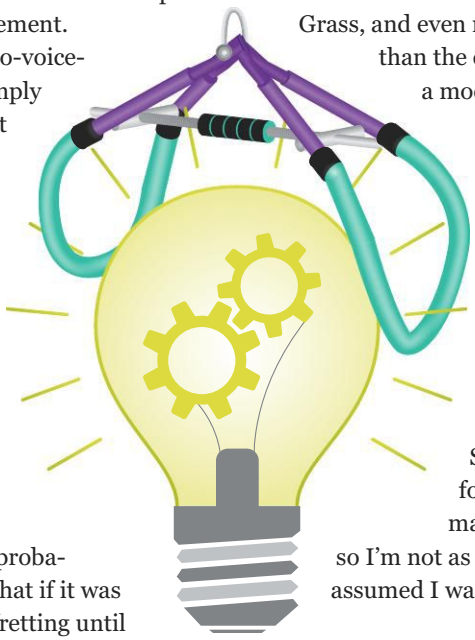
Everyone here knows that the 5 minutes before bed is the most dangerous time to be on call.

The other night was no different. I'd just got my 2-year-old down for the night (I might have taken a short nap, too) and was groggily headed to bed.

Suddenly, I hear that awful "Over the Horizon" ringtone. My favorite wake-up-you're-on-call announcement.

I'm a let-the-call-go-to-voicemail sort of guy, so I simply turned around and went to put my coveralls on. Dressed, I head to the truck and listen to the voicemail: a prolapse. The night keeps getting more interesting.

The voicemail said, "Doc, see if you can save her. If not, please execute a humane euthanasia." Not a good omen for a prolapse, I think. They probably wouldn't have said that if it was a small one but no use fretting until I'm there.



COMPLICATING FACTORS

Fast-forward 30 minutes, and I pull into the farm's drive. Lucky for me they have some night help, and he points me in the direction of the emergency.

Walking up to the cow, I immediately see a massive prolapse. Not the largest I've ever seen, but certainly in my top 10. The complicating factor? She's down in the scrape alley with milk fever.

Sometimes I miss the days of James Herriot, where these things were in the back 40 — not so much for the level of medicine back then but more so for my knees. Grass, and even mud, is easier on them than the concrete scrape alley of a modern freestall barn.

As I start unpacking my bag and preparing for a knee-bruising night, I hear, "Señor?" Behind me is the night manager who led me to the cow.

He starts rattling off sentences in Spanish. Unfortunately for him, I chose German back in high school, so I'm not as useful as he maybe assumed I was in this conversation.

A BRILLIANT IDEA

Lucky for me, he quickly realized my shortcomings. After much pointing and gesturing he says, "Lift?" I was thinking he meant lift, as in to move her to a sand pack that was about 5' away. Sure, why not, I think. At least my knees will be saved.

But, the night manager disappears into the dark. A minute or two later he returns with a skid steer and a hip lift.

Confused, I ask, "Lift?"

He replies, "Lift."

Clearly, we have reached the extent of my

> *It is the easiest prolapse I've ever done. All from an idea I couldn't understand in the moment.*
> —Eric Rooker

ILLUSTRATION: LINDSEY POUND

communication skills. I decide to step back and watch to see what he is going to do.

He attaches the hip lift to the cow and lifts her butt up about 3'. Out of the cab of the skidsteer, all I hear is, “Push?”

At this point I realize what his idea is. Rather than trying to push this uterus in, while I’m down on the concrete with a cow struggling to get out of the frog-leg position, he has lifted her so I can replace the prolapse while standing.

I step under the bucket and clean the prolapse. I then invert it on her back and feel all the intestines — intestines I would have had to work against if she were down — fall right back into her belly.

How many times do we delve into a situation, determined to solve it, before we hear everyone’s ideas, regardless of whether we can understand them?
—Eric Rooker

Three minutes later the uterus is fully replaced.

Five minutes later her vulva is sutured, and we carefully guide her onto the sand pack.

It is the easiest prolapse I’ve ever done. All from an idea I couldn’t understand in the moment.

SLOW DOWN AND LISTEN

This got me thinking, just how many ideas do we discount or pass up every day because we can’t understand them in the moment? How many times do we delve into a situation, determined to solve it, before we hear everyone’s ideas, regardless of whether we can understand them or not?

This might not be a novel concept for everyone, but it was a great reminder to me to slow down and listen.

All I know is that from here on out I’ll be asking if my down prolapses have a hip lift. BV

Summer Slump

Researchers offer four ways to beat heat stress

BY MAUREEN HANSON

> "The thermoneutral zone of calves, beyond which they begin to feel heat stress, is between **55°F and 77°F**. For heifers gaining 1.8 lb. per day, it's between **32°F and 59°F**."

When it comes to calf and heifer nutrition, heat stress deals a double whammy. The animals must expend more energy for body heat regulation; at the same time they don't feel like eating, which reduces dry-matter intake.

A recent review published in the Journal of Animal Science and Biotechnology on the impact of heat stress on dairy calves and heifers showed:

- **Calves and heifers subjected to heat stress had lower** feed intake, average daily gain and feed efficiency, compared to animals in cool or neutral climate conditions.
- **Energy expenditure on maintenance and metabolism** increases to remove body heat load.
- **Gastrointestinal motility decreases** in the body's attempt to reduce metabolic heat, so lower ruminal passage rates of feed have been observed.
- **Heat stress affects rumen microbiota and fermentation in older heifers.**

NUTRITION CAN HELP

The review authors suggest nutritional alterations can help calves and heifers navigate heat stress without sacrificing gain. They include:

1. **Increasing volume and nutrient density in liquid rations** of preweaned calves, to compensate for the reduction in starter-grain intake during heat stress.
2. **Increasing the ration nutrient density for older heifers.** The authors propose increasing dietary fat without reducing dietary fiber, because heifers still need fiber to ruminate and maintain health.
3. **Supplementing heifer rations** with zinc and vitamins A, C and E to help relieve oxidative damage due to heat stress.
4. **Balancing heifer rations** for dietary cation-anion difference (DCAD) to support electrolyte balance, help maintain the blood-acid base and correct mineral deficiencies caused by loss of sodium and potassium due to sweating.

When should these nutritional strategies be deployed? Probably sooner than you think. The authors state the thermoneutral zone of calves, beyond which they begin to feel heat stress, is between 55°F and 77°F. For heifers gaining 1.8 lb. per day, it's between 32°F and 59°F. BV

PHOTO: WYATT BECHTEL; ILLUSTRATION: LINDSEY POUND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Stop Raising 'Peter

Immature animals entering the milking herd never reach their full potential

BY TAYLOR LEACH

Isn't there a small piece in all of us that wishes we could never grow up? To stay young, wild and free just like Peter Pan and his adventures on the island of Neverland? While it's a whimsical dream we all wish could come true, the reality of growing up is something we all must face, including the heifers on our farm.

According to Gavin Staley, DVM and technical service specialist at Diamond V, dairy farmers across the country are facing a new kind of pandemic: immature heifers entering the milking herd. These animals seem inconspicuous at first but have a way of digging deep into farmers' pocketbooks later due to lower milk production, increased health issues and their annoying ability to have trouble breeding back.

"There's been an unfortunate trend over the last number of decades to breed heifers earlier, and there's a number of valid reasons why farmers want to do that, with high feed prices being one of the main ones," Staley says. "But if heifers are not mature when they calve, we wind up with a lot of negative, long-lasting side effects along the way."

He goes on to says heifers who calve before they are physically ready are never able to reach their full potential. Tina Kohlman, a regional dairy Extension educator for the University of Wisconsin-Madison, concurs, adding heifer maturity should not be determined by the animal's age.

"Heifers can calve earlier to reduce feed and rearing costs but must calve at the ideal weight," Kohlman says. "Heifer maturity, or the heifer's weight at calving, is an important benchmark in heifer management. It is the easiest factor to measure and track. Weight at calving not only determines the performance of first-lactation heifers but also lifetime performance."

KNOW YOUR BENCHMARKS

According to Kohlman, heifer maturity is important because the onset of puberty is not age-related, but size- and development-related. Instead, maturity depends on a heifer's plane of nutrition and average daily gain.

> *"Growth is the biggest driver for heifer maturity. One needs to focus on optimal growth rates throughout the heifer's life."* —Tina Kohlman

"Growth is the biggest driver for heifer maturity. One needs to focus on optimal growth rates throughout the heifer's life," Kohlman says. She provides the following growth benchmarks:

- **Puberty:** 45% of the dairy herd's mature body weight
- **Breeding:** 55% to 60% of the dairy herd's mature body weight
- **Precalving heifers:** 90% to 95% of the dairy herd's mature body weight
- **Postcalving (first lactation):** 80% to 85% of the dairy herd's mature body weight

BIG DOESN'T MEAN MATURE

Staley says producers need to move away from breeding heifers based on size and make the effort to weigh animals instead.

"Size can mask an animal's maturity," he says. "Just because she's big doesn't mean she's mature. Once a heifer calves, they grow seven times slower. Don't believe the people who say heifers will catch up when they enter the milking herd. They don't."

Kohlman shares similar thoughts: "It is not good practice to subjectively determine if a heifer is mature enough to breed. An investment in a scale can assist greatly in determining the best size to breed heifers, allowing one to analyze their heifer management program. Obtain mature body weights of the third lactation and greater cows at 80 to 120 days in milk to establish the

Pan' Heifers

benchmark for the heifer program. Weigh heifers at various stages of growth (birth, weaning, prebreeding, springing and freshening) to determine if you are achieving rate-of-gain goals."

Staley says first-lactation performance pretty much sets in stone the herd's performance.

"First-lactation milk production sets the 'ceiling' for the whole herd," he says. "The herd cannot outperform the production level set by first-lactation animals."

He goes on to say every pound of missing body weight could cost producers 7 lb. of milk production, meaning one month of growth deficit before calving costs seven months of lactation.

"Mediocrity lives in immaturity," Staley says. "Mature heifers transition well, peak well and breed back — all things that allow them to last in the herd. Elite herds are the ones who are taking the time to develop elite heifers." **BV**

MEETING MATURITY GOALS

Gavin Staley, DVM for Diamond V, offers six tips to help heifers meet their maturity goals before calving:

1. **Get mature body weights** on your third, fourth and fifth lactation cows at 80 to 120 days in milk.
2. **Weigh heifers as they freshen.**
3. **Set heifer health and growth goals** for all stages of heifer development, from colostrum feeding through calving, and then meet them.
4. **Weigh calves at various stages of growth** to determine if your heifer program is achieving rate-of-gain goals.
5. **If you are,** you can confidently breed heifers to calve at 22 to 23 months.
6. **If you are not meeting growth goals,** delay breeding so heifers are reaching their maturity weight goals at calving.

Dry-Off Decisions

PHOTO: WYATT BECHTEL

Acidogenic boluses help with end-of-lactation milk production

BY MAUREEN HANSON

When it comes to drying off cows today, it is often a case of too much of a good thing. Cows that are still milking heavily at the end of lactation have a hard time switching gears when they enter the dry period.

Attendees of a recent Iowa State University dairy Extension webinar learned the modern realities of milk production make it almost impossible to achieve the dry-off goal issued by the National Mastitis Council, which is 33 lb. of milk per cow per day or less.

University of Minnesota dairy researcher Luciano Caixeta, DVM, says the 33-lb. threshold is a standard in need of an update as it now excludes approximately 93% of dairy cows at dryoff. The median production at dryoff in Minnesota herds currently sits at about 62 lb. per cow per day.

"Cows milking heavily at dryoff are more susceptible to environmental mastitis infections," Caixeta explains. "They are at greater risk of milk leakage and have delayed formation of the keratin plug in the teat orifice."

He says mammary swelling at

STUDY EVALUATES 800 COWS

After preliminary research in Spain showed the bolus treatment to be effective, Luciano Caixeta and his team were commissioned to conduct a larger study involving more than 800 cows from commercial Minnesota herds.

Approximately half the cows were treated at dryoff with two boluses, each containing 102 g calcium chloride, 40.8 g calcium sulfate, and 20.4 g ammonium chloride (Bovikalc Dry). Caixeta says the ammonium chloride is key to creating the acidogenic effect that induces a mild, temporary metabolic acidosis. All cows received blanket intramammary dry-cow therapy, including teat sealant, as well.

The study followed the health and performance of both groups through their next lactation. Compared to the untreated controls, cows receiving the boluses were found to have:

1. **Longer periods of rest** – about 17 minutes per cow per day – in the first week after dryoff, with no difference in rumination behavior.
2. **Approximately 10% less subclinical mastitis,** measured via somatic cell count (SCC) at 70 days in milk.
3. **Approximately 20% lower incidence of clinical mastitis** cases in their next lactation.
4. **No significant difference in milk production** or reproductive performance.
5. **A greater total economic advantage** – assessed via a partial-budget analysis – of $34,074, or about $78.69 per cow.

> *Cows milking heavily at dryoff are more susceptible to e nvironmental mastitis infections.*
> —Dr. Luciano Caixeta

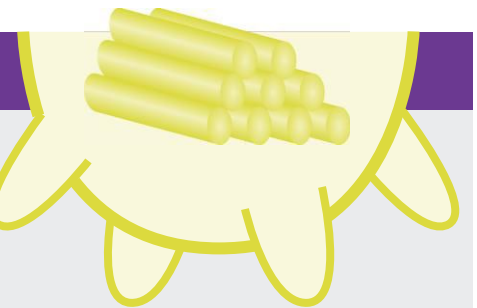
dryoff also is a welfare issue, noting that cows with engorged udders are more uncomfortable and reluctant to lie down and rest.

VARIOUS METHODS EVALUATED

Caixeta says achieving end-of-milk production can be accomplished by reducing milking frequency, feeding a lower quantity or concentration of TMR, or injecting cows with a prolactin-release inhibitor.

"All of these methods can work, but changing milking or feeding routines may not be practical for some dairies in terms of labor availability, facilities or both," Caixeta says. "And currently, there are no FDA-approved injectable prolactin-release inhibitors available in the U.S."

Another potential approach is administering acidogenic boluses enhanced with ammonium chloride to create an acetic environment in cows' digestive tracts. This incites a temporary, mild decrease in blood pH, resulting in decreased lactose synthesis and a moderate decline in dry-matter intake. **BV**



Caixeta says it appeared that herds with higher incidence of mastitis would benefit the most from bolus use, as they would retain the most revenue by averting the cost of mastitis therapy, sick-cow labor, discarded milk and involuntary culling.

Read What You Might Have Missed at *BovineVetOnline.com*. Scan the QR Codes Below.

WHEN SUMMER PINKEYE STRIKES

The problem can take a toll on cattle, especially calves. There are seven different serogroups of *M. bovis pili*, which explains why a pinkeye vaccine use in cattle sometimes seems to be a hit or miss proposition. Three bovine veterinarians provide their insights on diagnosing the problem and when to use and not use antibiotics for treatment.

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10 WAYS TO REDUCE STRESS IN BEEF OPERATIONS

Even with the best management practices in place, some stressful events such as shipping are unavoidable. These recommendations can help producers mitigate the risk of respiratory disease and other health issues in their herd.

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Head to Lancaster County, Pa., and you'll notice the sweet aroma of candy can be smelled on a family dairy farm. Red Knob Dairy has been feeding upcycled Hershey candy waste to cows for more than a decade.

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FEEDLOT CATTLE HEALTH SUMMIT

Last call to register for the event on July 12 in Kearney, Neb. The program is focused on how to improve cattle health and management from "start to finish in the feedlot," says Dr. Kip Lukasiewicz, consulting veterinarian and PAC owner. Find the agenda, and make your reservation now.

READ MORE

A GOOD STRATEGY IN LOW-FORAGE SITUATIONS

With drought, or even in periods of excess moisture, your producers can benefit from setting up a so-called "sacrifice area" where cattle can stay when grazing is detrimental to land and plants. It can be used during times that animals do not need to graze or in dormant seasons, too. The overarching idea is to help prevent cattle from completely sapping an operation's grazing resources.

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BUILDING CALF IMMUNITY
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Spot the signs and act swiftly

ISSUE FEATURE

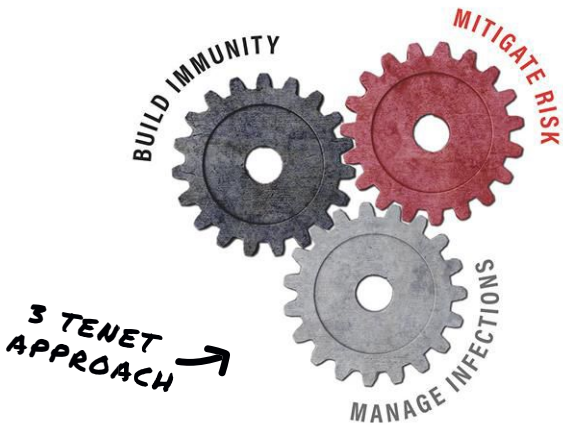
Respiratory Disease, We've Got You Surrounded

Boehringer Ingelheim

BRD: Why a More Holistic Approach Is Needed

By Craig Jones, DVM, Director of Cattle Professional Services, Boehringer Ingelheim Animal Health USA Inc.

The fight against bovine respiratory disease (BRD) is a constant battle for veterinarians and producers alike. It's frustrating, costly and the causes can be extremely hard to understand. Producers often ask us as veterinarians why certain groups of calves succumb to BRD, while other groups do very well. Others question why they recently started having issues with BRD, when their vaccination and management strategies have stayed the same.



There is no single action that can prevent disease 100% of the time. Many variables affect disease risk, and controlling BRD requires a multifaceted approach. Helping our clients develop an effective BRD battle plan includes three key tenets: building immunity, mitigating risk and managing infections.

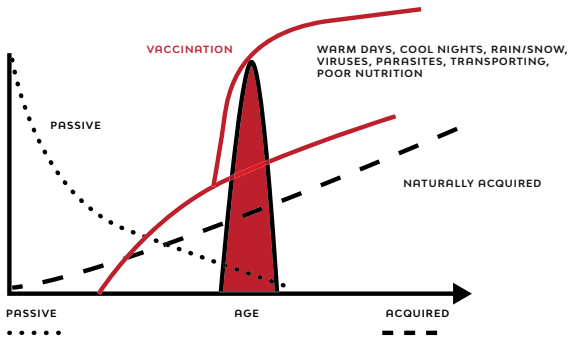
Implementing a holistic approach to battling the disease can turn the tide against BRD. If we arm producers with the right products, proper management strategies and an effective treatment plan, we can put cattle on track for lifelong productivity and well-being.

BUILD IMMUNITY

The Ingredients to Building BRD Immunity

By Chris Chase, DVM, Professor, Department of Veterinary and Biomedical Sciences, South Dakota State University

The First Ingredient: Colostrum



Newborn calves are born with a naïve immune system and depend on passive immunity from the dam's antibody-rich colostrum. As passive immunity wanes, vaccination is important to jump-start acquired immunity.

Preventing BRD starts the minute a calf gets up and nurses on the mama cow. When calves are born, they enter the world lacking any real immunity to disease. They go from a nice, warm sterile environment to a place with all sorts of bacteria. Calves are dependent on colostrum to build up the defenses they need.

We as veterinarians can't emphasize enough the importance of getting calves high-quality colostrum. The latest research shows that we need to give calves 2 to 3 liters of colostrum within four hours of birth.[1]

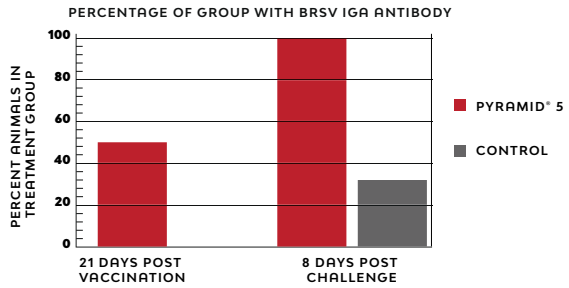
The Second Ingredient: Vaccination

As passive immunity from colostrum wanes, vaccines are needed to stimulate the calf's immune system to start producing its own antibodies against specific disease-causing agents.

In the past, it was believed there was no point in giving injectable respiratory vaccines before about 4 months of age, because they might be inactivated by maternal antibodies. But my colleagues and I were able to prove in a recent study that that's not the case.[2]

In our study, calves with maternal-derived immunity for bovine respiratory syncytial virus (BRSV) were administered an injectable modified-live virus (MLV) respiratory vaccine (Pyramid® 5 + Presponse® SQ) for BRSV or a placebo at 30 days of age. The calves were then exposed to BRSV about 70 days later. Compared to calves that received a placebo, those administered PYRAMID 5 had fewer clinical signs and lung lesions, as well as less viral shedding.[2]

These findings proved that PYRAMID 5, when given to calves at 30 days of age, can overcome maternal antibodies to stimulate protective immunity against BRSV. That's not to say all MLV injectable vaccines can do this. PYRAMID 5 vaccine includes a unique adjuvant, called MetaStim®, that protects vaccine antigens from maternal antibodies, thus enhancing the immune response, even in calves still maintaining high levels of maternal antibodies acquired from colostrum.



PYRAMID vaccines are proven to stimulate:

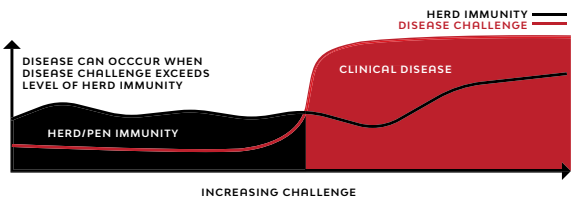
- BRSV IgA antibodies for mucosal immunity
  - By 8 days post-challenge, ALL the vaccinates were positive for the expressions of IgA compared to 5/16 of the controls[2]
- An immune memory response for systemic immunity[2]

MITIGATE RISK

Investigating the Causes of Respiratory Disease

By Dan Cummings, DVM, DABVP, Heritage Vet Partners

Quality colostrum and timely vaccination can get animals off to a great start, but even in a vaccinated animal, stress can compromise their immune system and make them susceptible to disease.



Good colostrum management and vaccination can help raise herd immunity above the level of disease challenge. Stressors and management factors can increase the disease challenge above herd immunity, leading to infection.

Stress can come in many forms on a beef operation: shipping, commingling, weather extremes and diet changes, to name a few. Although some level of stress is unavoidable, there are many management factors producers do have control over in their operations.

BRD, we need to act as investigators. We need to go back to the scene of the crime, and work with our producers to review the answers to several key questions:

- Are you keeping new animals from different sources separate? If keeping these animals separate isn't possible, are you using a preconditioning program?
- Do you have a deworming protocol in place?
- Are you testing incoming calves for bovine viral diarrhea virus (BVDV), and removing persistently infected (PI) calves from the group? Are you isolating BVDV-infected groups from others on the farm to mitigate exposure?
- How are your facilities? Are they well-ventilated?
- How often are you bedding? What are you bedding with?
- What is your stocking density? Are you experiencing overcrowding?
- How often are you cleaning your water sources, feed bunks or other heavy-use areas?
- Are you practicing low-stress handling techniques?
- How is your bunk management?
- What does your calves' diet consist of? Have there been any recent changes?

These factors can all contribute to stress and potential disease outbreak, and they can be additive. I recently had a case in which a producer purchased a large group of lightweight calves that were commingled. It was extremely hot in the beginning of August, and to cap it off, we had a PI calf in that group. It was a tremendous health challenge, and caused severe economic losses for that producer.

When we think about all of these factors, we need to break them down and have strategies in place to help producers manage each of them. In those instances, we need to think about purchasing fewer animals or keeping them in smaller, separate groups to increase bunk space and prevent the spread of disease — and we should pair that with low-stress handling techniques. This is also a situation in which we may want to discuss metaphylaxis or mass medication with an antibiotic.

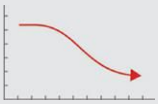
"Good management is the backbone of controlling BRD. We focus on pushing manure, putting in straw, keeping animals dry and comfortable. Ventilation is also a real key."

— Brad Dickman, C&D Cattle, Alma, MI

Persistently Infected Calves: Silently Spreading Disease for a Lifetime

Calves become infected with BVDV while in the uterus.

About 50% of PI calves will be "poor doers," and die before about 1 year of age.



The virus suppresses the immune system, making calves more susceptible to other diseases.

Other PI calves often show no signs of disease when they're born.

They'll continue to shed the virus daily, exposing other cattle.

70% - 100% of non-vaccinated or immune-suppressed cattle become infected when exposed to a PI calf.[3,4]

MANAGE INFECTIONS

Five Ways to Help Producers Get Better Treatment Outcomes

By Joe Gillespie, DVM, Boehringer Ingelheim

Despite our best efforts to help producers prevent it, BRD impacts every cattle operation. To ensure producers get the best treatment outcomes possible, here's the advice I recommend to clients:

- **Train your staff to recognize the signs of disease early.** Every person working with cattle should be able to detect a sick animal. Identifying signs and diagnosing BRD early, almost when the animal is on the verge of getting sick, is ideal. Early diagnosis will help producers get the best treatment response out of an antibiotic.

- **Be ready to find the specific cause of BRD.** Make sure producers know that they can come to you when additional diagnostics are needed, and the earlier they come to us, the better. Relying solely on a necropsy to identify the bacteria or viruses responsible can be misleading. It is likely that the culprit involved in the initial stages of the disease has changed by the time the animal dies. So, I try to emphasize that we can do more than a necropsy, and it's actually ideal for us to come out and perform tests (such as a nasal swab, blood test or thoracic ultrasound) on live calves.

- **Use a long-lasting, fast-acting antibiotic.** An effective treatment should provide calves with a rapid response to minimize lung damage, and be long-lasting to give them the best chance of recovery. There are four main bacteria that we worry about most when it comes to BRD: *Mannheimia haemolytica, Pasteurella multocida, Histophilus somni* and *Mycoplasma bovis*. Generally, we should recommend an option like Zactran® (gamithromycin) that's going to cover those four primary pathogens.[5]

ZACTRAN IMPORTANT SAFETY INFORMATION: Do not treat cattle within 35 days of slaughter. Because a discard time in milk has not been established, do not use in female dairy cattle 20 months of age or older, or in calves to be processed for veal. Subcutaneous injection may cause a transient local tissue reaction in some cattle that may result in trim loss of edible tissues at slaughter.

- **Provide a post-treatment interval (PTI).** We know there are producers who will treat an animal, come back the next day, and want to treat again if the animal isn't looking better. The producer's intentions are good, but giving another dose in that situation increases cost without necessarily increasing effectiveness. We need to be clear with producers that the antibiotic needs time to do its job, and help them establish a PTI that works for their specific operation.

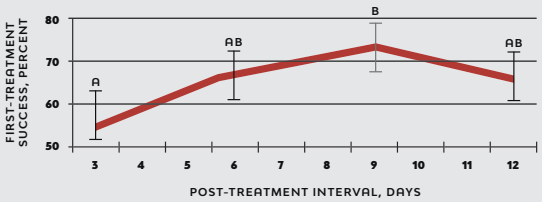
- **Keep records.** Record keeping can feel like a hassle for some producers, but I try to emphasize that even a basic set of records (ID, date of treatment, dose, withdrawal period) can go a long way. That information can help us piece together whether their protocol is working.

"We own the cattle, and we're working with them every day. A sick calf comes directly out of our paycheck. So, we're paying attention to signs of BRD. We look at their eyes, the way they're acting, how they're holding their head. The list goes on and on."

— Brad Dickman, C&D Cattle, Alma, MI

Study: Comparison of Gamithromycin PTIs for Beef Cattle Naturally Affected with Bovine Respiratory Disease

A recent trial found that a six- to nine-day post-treatment interval for Zactran® (gamithromycin) resulted in the best health outcomes for calves infected with BRD.[6]



Read more about the trial here:

BRD BATTLE PLAN

A BATTLE IS WON LONG BEFORE IT IS FOUGHT.

BRD is a fierce adversary. So much so that producers won't subdue it with products alone. No. Neutralizing BRD will require a cross-disciplinary plan of attack: Build immunity with **Pyramid® + Presponse® SQ**, mitigate risk, and manage infections with **Zactran® (gamithromycin)**. Next time BRD is on their radar, equip producers with this three-pronged battle tactic. After all, brainpower is the ultimate weapon.

Brush up at BRDBattlePlan.com

ZACTRAN® (gamithromycin) PYRAMID® + PRESPONSE® SQ

ZACTRAN IMPORTANT SAFETY INFORMATION: Do not treat cattle within 35 days of slaughter. Because a discard time in milk has not been established, do not use in female dairy cattle 20 months of age or older, or in calves to be processed for veal. Subcutaneous injection may cause a transient local tissue reaction in some cattle that may result in trim loss of edible tissues at slaughter.

[1] Homerosky ER, Timsit E, Pajor EA, Kastelic JP, Windeyer MC. Predictors and impacts of colostrum consumption by 4h after birth in newborn beef calves. *Vet J* 2017;228:1–6.
[2] Kolb EA, Buterbaugh RE, Rinehart CL, et al. Protection against bovine respiratory syncytial virus in calves vaccinated with adjuvanted modified-live virus vaccine administered in the face of maternal antibody. *Vaccine* 2020;38(2):298–308.
[3] Fulton RW, Briggs RE, Ridpath JF, et al. Transmission of bovine viral diarrhea virus 1b to susceptible and vaccinated calves by exposure to persistently infected calves. *Can J Vet Res* 2005;69(3):161–169.
[4] Fulton RW, Johnson BJ, Briggs RE, et al. Challenge with bovine viral diarrhea virus by exposure to persistently infected calves: protection by vaccination and negative results of antigen testing in non-vaccinated acutely infected calves. *Can J Vet Res* 2006;70(2):121–127.
[5] ZACTRAN product label.
[6] Theurer ME, Fox JT, Portillo TA, et al. Comparison of gamithromycin post-treatment intervals for beef cattle naturally affected with bovine respiratory disease. *Bov Pract* 2020;54(2):105–111.

Boehringer Ingelheim Cattle First.

ZACTRAN® (gamithromycin)

150 mg/mL ANTIMICROBIAL

NADA 141-328, Approved by FDA

For subcutaneous injection in beef and non-lactating dairy cattle only. Not for use in female dairy cattle 20 months of age or older or in calves to be processed for veal.

Caution: Federal (USA) law restricts this drug to use by or on the order of a licensed veterinarian.

READ ENTIRE BROCHURE CAREFULLY BEFORE USING THIS PRODUCT.

INDICATIONS

ZACTRAN is indicated for the treatment of bovine respiratory disease (BRD) associated with *Mannheimia haemolytica*, *Pasteurella multocida*, *Histophilus somni* and *Mycoplasma bovis* in beef and non-lactating dairy cattle. ZACTRAN is also indicated for the control of respiratory disease in beef and non-lactating dairy cattle at high risk of developing BRD associated with *Mannheimia haemolytica* and *Pasteurella multocida*.

CONTRAINDICATIONS

As with all drugs, the use of ZACTRAN is contraindicated in animals previously found to be hypersensitive to this drug.

WARNING: FOR USE IN CATTLE ONLY. NOT FOR USE IN HUMANS. KEEP THIS AND ALL DRUGS OUT OF REACH OF CHILDREN. NOT FOR USE IN CHICKENS OR TURKEYS.

DOSAGE AND ADMINISTRATION

Administer ZACTRAN one time as a subcutaneous injection in the neck at 6 mg/kg (2 mL/110 lb) body weight (BW). If the total dose exceeds 10 mL, divide the dose so that no more than 10 mL is administered at each injection site.

Body Weight (lb)	Dose Volume (mL)
110	2
220	4
330	6
440	8
550	10
660	12
770	14
880	16
990	18
1100	20

Animals should be appropriately restrained to achieve the proper route of administration. Use sterile equipment. Inject under the skin in front of the shoulder (see illustration).

The Safety Data Sheet (SDS) contains more detailed occupational safety information. To report suspected adverse drug events, for technical assistance, or to obtain a copy of the SDS, contact Boehringer Ingelheim Animal Health USA Inc. at 1-888-637-4251. For additional information about adverse drug experience reporting for animal drugs, contact FDA at 1-888-FDA-VETS, or online at www.fda.gov/reportanimalae.

RESIDUE WARNINGS: Do not treat cattle within 35 days of slaughter. Because a discard time in milk has not been established, do not use in female dairy cattle 20 months of age or older. A withdrawal period has not been established for this product in pre-ruminating calves. Do not use in calves to be processed for veal.

PRECAUTIONS

The effects of ZACTRAN on bovine reproductive performance, pregnancy, and lactation have not been determined. Subcutaneous injection of ZACTRAN may cause a transient local tissue reaction in some cattle that may result in trim loss of edible tissues at slaughter.

ADVERSE REACTIONS

Transient animal discomfort and mild to moderate injection site swelling may be seen in cattle treated with ZACTRAN.

EFFECTIVENESS

For information on effectiveness, the product label in full can be found at https://www.zactran.com/sites/default/files/pdfs/Zactan_Label.pdf.

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